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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,543	04/19/2001	Stig Sarkimukka	2466-63	7576

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EXAMINER
ARTMAN, THOMAS R

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No.	Applicant(s)	
	09/837,543	SARKIMUKKA ET AL.	
	Examiner	Art Unit	
	Thomas R Artman	2882	

-- *The MAILING DATE of this communication app ars on the c ver sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 7 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander (US 5,712,932) and in view of Roberts (US 5,949,560).

Regarding claims 1 and 9, Alexander discloses an optical WDM transmission network (Fig.1), including:

1) a transmitting side and a receiving side connected by an optical fiber link (item 50),

2) high-priority information (customer information, as opposed to service channel, item 235) being transmitted over the system over a number of wavelength bands less that the total number of wavelength bands, and

3) transmission takes place over a plurality of wavelength bands.

Although it is not explicitly shown that there is a receiving side, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a transmission portion of a network is going to have a receiving side with the same number of channels.

Alexander does not specifically disclose a switch for transmitting the high-priority information in specific wavelength bands, or a controller connected to the switch for selecting

the wavelength bands for the transmittal of the high-priority information given a sufficient total quality of the transmission.

Roberts discloses the method and structure for an optical transmission method that can be used in WDM systems (col.10, lines 40-42), that includes:

1) a transmitting and receiving side and an optical fiber link with information being transmitted and received over a plurality of wavelength bands where PMD is different and changes over time for each band,

2) a first switch for switching information between a plurality of wavelength bands, and

3) a controller for selecting, at each instant, a wavelength band for transmitting information such that the overall quality of the transmission is improved.

As described in col.4, lines 23-54, Roberts' method reroutes information via cross-connects over channels (different wavelength bands) that are within a predetermined PMD threshold.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to switch high priority information to wavelength bands that are performing better at each instant for an overall improved quality of the transmission. Roberts specifically teaches the practice of switching information from channel to channel as the PMD quality degrades below a certain threshold.

With respect to claims 2 and 10, Roberts has a quality monitor at one end of the transmission system such that PMD evaluation can take place and the controller knows what to do.

In regards to claims 3 and 11, Roberts shows cross-connects on both ends of the communication system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a switch at the other end of the transmission system. Optical transmissions work in reciprocal: if you have a multiplexer, cross-connect, etc., on the transmitting end, then you must have a de-multiplexer, cross-connect, etc., on the receiving end. This is the only way to "undo" what's been done to the signals: whatever is done to the signals on the transmitting end must be "undone" on the receiving end such that the signals can be recovered properly for downstream use.

Further regarding claim 11, it would have been obvious to one of ordinary skill in the art at the time the invention was made that all optical transmission systems send and receive information that begins and ends in the electrical domain.

With regards to claims 4 and 12, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the switching in the electrical domain. Electrical switches of the sort are well known and proven in telecommunication systems. Particularly since fiber optic communications are replacing electrical communication networks, to continue switching in the electrical domain using existing equipment allows for cost-effective upgrading of current communication networks.

With respect to claims 5 and 13, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the switching in the optical domain. Optical switching takes far less space since there have been well known optical switches available, such as solid state switches, that can integrate seamlessly with other integrated circuit devices and interface well with optical fibers using known connector technologies. Furthermore, though more expensive that using existing electrical equipment, there is an improvement in switching speeds and can be more cost-effective in the long run to replace aging electrical switching systems when upgrading to optical fiber based communication.

In respect to claim 7, it would have been obvious to one of ordinary skill in the art at the time the invention was made that, as seen in Alexander, any wavelength bands not used for high-priority information are delegated to carrying the low priority information. As is well known in the art of data transmission, high priority signals are more important and get the best, fastest transmission over the low priority signals.

Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander and Roberts, and in view of Krol (US 2002/0126935) and Bergano (US 6,411,413).

With respect to both claims, the structure as applied above against claim 1 applies here and the following. Though Alexander and Roberts do not disclose the use of tunable electro-optic transmitters as part of the switching mechanism, Krol teaches of using tunable filters for

channel switching, on p.1, pars. [0005], [0006], and [0010]. These filters are tuned to specific bands (channels) within a transmission band.

Though Krol doesn't use tunable electro-optic transmitters, Bergano teaches the use of using such devices in col.4, lines 5-16. Tunable semiconductor lasers exist that are well known in the art to have wide tuning ranges within the optical transmission bands. Here, these tunable lasers can perform the same function as the prior art tunable filters described in Krol to select specific wavelength bands within a bandwidth.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use tunable electro-optic transmitters to perform specific wavelength band selection within a given bandwidth in an optical communication system. The tunable transmitters would negate the need for the complex optical switching required for wavelength band selection. Optical switches generally have as much as –3dB or more intensity reduction during transmission and contribute to other problems, including PMD. Using a tunable source would remove these added flaws in the transmission system, transmitting a cleaner, stronger signal into the transmission line.

Claims 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander and Roberts, and in view of Way (US 6,421,153).

Regarding both claims, Alexander and Roberts do not disclose the use of PMD compensators. Way discloses an active PMD compensator that is used in a WDM system for eliminating the bulk of PMD in optical signals as a result of propagating through optical transmission lines. They are well known and necessary in modern WDM systems with longer

transmission lines and higher bit rates. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use active PMD compensators in an optical transmission system.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Danagher (US 6,101,012) discloses a versatile optical communication system with cross-connects and add/drop mux/demux devices; Tada (US 6,212,167) teaches of a flexible optical communication system for rerouting information and preserving high priority signals in the event of channel failure; Flanagan (US 5,933,258) teaches of a flexible optical communication system with fault protection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

TRA
May 1, 2003

DAVID V. BRUCE
PRIMARY EXAMINER